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ABSTRACT

Issues related to the illegal copying or piracy of educational software in the schools and its potential effect on quality software availability are discussed. Copyright violation is examined as a reason some software producers may be abandoning the school software market. An explanation of what the copyright allows and prohibits in terms of computer software is followed by a list of five legal principles for assessing legality of software use. The remainder of the paper addresses questions of whether controlling piracy would automatically improve software quality; whether the home market will really be sufficiently more lucrative than the educational market to cause software producers to abandon the school market; whether illegal copying is really widespread in the schools; and whether piracy alone is a major cause of poor software. Also examined are the current quality and perceptions of quality of educational software, why so much copyright violation exists, and what can be done to assure quality courseware for the schools. (LMM)

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COPYRIGHT AND THE ASSURANCE OF QUALITY COURSEWARE

by

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"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

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What does copyright have to do with the assurance of quality in educational software? This question at first appears to be another of those academic questions that tend to engage the questioner far more than any listeners or readers. But unlike many of those academic questions, this one has a dramatically pragmatic, "real-world" dimension. Ask any commercial developer or producer of instructional software about the relationship between copyright law and the quality of instructional software and you will receive the following hypothetical answer, a composite of frequently heard individual statements: "The quality of educational software, which admittedly leaves something to be desired, is a direct result of the piracy (illegal copying) so extensive in the schools that it deprives us of the profits we need to invest in producing higher quality software. In fact, copyright violation in the form of making illegal duplicate copies of our software is so rampant that we may have no alternative but to abandon the endeavor entirely and focus on the home market for instructional software."

For the born skeptics inclined to question whether software producers are in fact ready to drop the school market so soon, it is worth noting that Atari has recently made that decision in terms of its hardware, discontinuing discount education contracts, closing its regional educational sales offices, and raising the price of the Atari 800 XL nearly 30% over the price previously paid by schools, which will now be forced to buy directly from retail dealers [1]. Aside from the informal statements made in producer-educator dialogues such as the one sponsored by the National Institute of Education and the Association of Educational Communications and Technology in September, 1983, some commercial educational software producers fortify their "threat" to abandon the school market for the home market by comparing the size of the potential markets--and, of course, the number of schools or even classrooms

does not begin to compare to the number of homes and families waiting to be "marketed."

If the quality of courseware is so directly affected by the extensiveness of piracy in the schools, can we infer that controlling that piracy would automatically improve the quality of the software? How likely is it that the home market will prove so much more lucrative than the school market that software producers will abandon the latter? Are they <u>really</u> unable to turn a profit on their educational software? Is piracy, or illegal copying, really so rampant in the schools? Can't educators make <u>any</u> copies of their purchased programs? If making duplicate copies of a computer program on a disk or cassette is illegal, why are educators engaging in that illegal activity? Is piracy the real villain in the quality problem? Or are there other factors affecting the quality of instructional software? And just what is the assessment of the quality of educational software? Is it poor and in need of improvement or is it good and in imminent danger of declining? Finally, in either case, what can be done to assure quality courseware for the schools?

Before we can begin to answer this cluster of questions, we must know precisely what the copyright law allows and what it prohibits in terms of computer software. Enlightened discussion of the problems and solutions, after all, can only predicated upon a clear understanding of the copyright law and its applications to the educational setting.

<u>What the Copyright Law Says</u>

The federal copyright law revised in 1976 as P.L. 94-553 was amended in 1980 to clarify the copyright protection provided for computer programs. The amended Section 117 states that

". . . it is not an infringement for the owner of a copy of a computer

program to make or authorize the making of another copy or adaptation of that computer program provided:

> "(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
>
> "(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

"Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

While some of the intricacies of this provision are being and will be debated by legal experts throughout the coming years, what the public in general and educators in particular need to understand is that the law clearly prohibits--absent permission from the copyright owner--the making of duplicate copies to be distributed and used by others than the owner of a particular piece of copyrighted software. The making of <u>one</u> back-up copy for archival purposes only is permitted, presumably to enable the user to retain access to a program even if the original, purchased copy is destroyed or damaged and sent to the manufacturer for repair or replacement. Some attorneys specializing in copyright law construe section 117 to permit the making of an indefinite number of copies for archival purposes, as long as those copies are never given, loaned, sold or leased to someone else without being accompanied by the original copy from which the duplicate copies were made. Whether the

copyright law permits the making of single or multiple copies solely for archival purposes may be an interesting legal question, but the implications are academic rather than practical for most users within and outside the education profession. What is unquestionably illegal, however, is the unauthorized duplication and use of copies made from an originally purchased copy.

Equally illegal is the making of duplicate copies from a borrowed disk or cassette. The copyright law, we must note, specifies the permissibility of making one archival copy by the "owner" of a copy of a computer program. Educators, then, who rent, borrow, or preview a copy of an educational program in diskette or cassette form and make one or more copies for use by students in a classroom or computer laboratory may be saving the taxpayers a considerable sum of money, but they are also violating the copyright law. In short, the only legally duplicated copy of a computer program is the copy made by the owner of the master copy and retained in that person's possession solely for archival or back-up purposes.

Legal Ambiguities in the School Setting

The copying of a program from one disk or cassette to another is a clear and unquestionable violation of copyright law. In the educational setting, however, there are other, more subtle ways of making one copy of a program service a number of students simultaneously. For example, teachers may--and do--use one disk (if it contains a single-loading program) to boot up sequentially any number of microcomputers in the classroom or laboratory. With the program in the computers' memories, that program can then be run by students at their computers just as if the disk were still in the drive. Is this legal?

At first, we might be tempted to agree with that teacher that he or she has made no additional copies of the program and therefore is innocent of violating the copyright law. However, the copyright law defines the term "copy" in such a way as to include any form of a copy of a computer program. Section 101 defines "copies" as "material objects . . . in which a work is fixed. . . ." And "[a] work is 'fixed' . . . when its embodiment in a copy . . . is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration." Given these definitions, a computer program in computer storage--whether in RAM or ROM--is considered a copy because it may be repeatedly reproduced or accessed. This interpretation of what constitutes "a copy," derived from the influential CONTU Report,[2] has been upheld by the seven state and federal courts which have to date ruled on the issue of whether software in the form of operating systems contained on silicon chips embedded inside the computer constitutes "copies" of programs meriting copyright protection. (Franklin's out-of-court settlement with Apple in February, 1984, prior to a U.S. Supreme Court hearing further reinforces the consensus about what constitutes a "copy" of a computer program.) Returning to our example of sequentially booting up a series of microcomputers with one disk, it seems reasonable to expect that such a practice would be considered an illegal duplication of "copies" even though those copies are not tangible or visible.

A more ambiguous use of computer software in the schools is the newly developing trend to network a number of microcomputers together so that one program is accessible to a number of students simultaneously. A program designed for use by a single microcomputer may need a bit of modifying to run in a networked system, but as increasing numbers of educators acquire skill and sophistication with the hardware and the software, such modification is

entirely feasible and therefore quite likely. A network system raises numerous legal questions which haven't begun to be answered in any definitive way.

Each of the several types of networks raises its own types of questions, of course, and it is peripheral to our discussion to do more than offer one or two as examples. One of the crucial questions is whether a network constitutes "a machine" (as referred to in section 117) or several machines. Whether to define "a machine" in terms of the hardware or the software is equally problematic, for some programs designed for a network of microcomputers temporarily limit the functioning capacity of the otherwise independent units. Some legal experts question whether the difference is legally significant between a single-loading program and one which "travels" back and forth between drive and CPU (as for example a word processing program will do). Others are concerned about the difference between a network in which the program in the centralized unit enters the memory of each individual station and a network in which each station merely accesses its own "dedicated" portion of the main memory in a centralized unit.

Educators need not wait, however, for the legal and judicial enterprises to resolve these complex technological/legal questions which perhaps are irresolvable anyway. Fortunately, we are not limited to section 117 and section 101 of the copyright law when trying to determine the legality of various uses of computer software. There are, additionally, several legal principles derived from the copyright law and the functions it is intended to serve. An in-depth discussion of these principles is beyond the scope of this essay, but they will be briefly identified and elucidated.

Legal Principles For Assessing Legality of Software Use

There are five basic legal principles or tests by which to assess the

legality of specific uses of computer software. These include 1) the market effect test, 2) the intended use test, 3) the distinction between simultaneous and sequential users, 4) the fair use concept, and 5) the applicability of licensing agreements that often accompany purchased software.

1) The market effect test derives from the function of the copyright law, which is to protect the financial interests of creative people. To pass this test, the questioned use of a computer program must not deprive the copyright owner of rightful profits. The making of duplicate copies in order to save oneself or others the expense of purchasing a copy, then, deprives the copyright owner of the profits otherwise earned from the sale of an equivalent number of copies--failing the market effect test. Making one purchased copy accessible to multiple simultaneous users in a school through sequentially booting up a series of computers with one disk or cassette is also likely to fail the market effect test, for the copyright owner has undoubtedly been deprived of profits from sales of copies equivalent to the number of computers on which the program is simultaneously running. Another approach to the market effect test is to apply the golden rule for computer users, attributed to Joseph MacDonald: "Take not from others to such an extent and in such a manner that you would be resentful if they so took from you." In other words, put yourself in the shoes of the producer or copyright owner. If you would resent the usage in question, it is because you are losing profits and therefore that usage is certainly questionable and probably illegal.

2) The intended use test provides a helpful supplement to the market effect test by requiring consideration of the design of the program and the intention of its designer. It is especially helpful in resolving questions about the legality of networking microcomputers. Specifically, if the program

is designed to serve a network, reason suggests that such a use would not violate the copyright law. If, however, the program is designed to be used by a single user in a single microcomputer, and it is modified to serive multiple users in a network, it is not being used as intended--thereby failing the intended use test. The latter example also, by the way, fails the market effect test, in depriving the copyright owner of profits from potential sales of additional copies of the program.

3) The distinction between simultaneous and sequential users derives substantially from the market effect and intended use tests. But the rationale derives from the right of the owner of a program in disk or cassette form to do with that program what he or she will, as long as no duplicate copies are made (beyond the permissible archival copy). That means that the owner of, say, a Wordstar program, can loan the copy to someone else to use either on his or the other person's computer; the owner can use the owned copy on someone else's computer; and the owner can loan the Wordstar to any number of individuals--one at a time, of course, that being the only option. Experts in copyright law agree that software use involving multiple sequential users is much less problematic--much less likely a potential violation of copyright law than is software use involving multiple simultaneous users. This helpful distinction, however, is not without potential ambiguities arising from the fact that multiple users, whether simultaneous or sequential, constitute a proliferation of users. And controlling the proliferation of users is held, even and especially by those who interpret the copyright law to permit the duplication of multiple archival copies [3], to be the intent of section 117.

4) The fair use concept differs from the three previous tests in that it is contained explicitly within the larger copyright law while the latter are legal principles derived secondarily from the nature and function of the

copyright law. Embodied in section 107, the concept of fair use is intended to balance the interests of copyright owners with the needs of others for access to copyrighted material. Educators are prime but not the sole beneficiaries of this provision, which facilitates limited access to copyrighted works not only for researchers and teachers, but also for media reporters who review, report and comment on such copyrighted works. In determining fair use, the following factors are to be considered.

a) The purpose and character of the use, including whether the copied material will be for nonprofit, educational use or for commercial use--though courts have already established that the absence of financial gain itself is insufficient for a finding of fair use.

b) The nature of the copyrighted work, with special consideration given to the distinction between a creative work and an informational work. For example, copies made of a newspaper or newsmagazine column merit less protection than copies made of a musical score or a short story. Copies made of material prepared for classroom consumption merit more protection than copies prepared for public consumption. At least part of the rationale for this, obviously, stems from the market effect test; a teacher who photocopies a workbook page or a textbook chapter is depriving the copyright owner of sale profits in a way that he or she is not depriving a copyright owner of sale profits by the copying of one page from the daily paper.

c) The amount, substantiality or portion used in relation to the copyrighted work as a whole. This factor requires consideration less of the number of lines or pages copied than of the proportion of the larger work that is copied and used.

d) The effect of the use upon the potential market for the value of the copyrighted work. This is, of course, the most decisive and enlightening factor for determining fair use of computer software and it serves as the

basic principle from the other three factors are derived and to which they are related.

Applying these four factors to computer software, we find the fair use concept only moderately helpful, and certainly not very encouraging from the perspective of an educator looking for support for the most generous possible interpretation of what the copyright law allows. The first factor, pertaining to the character and purpose of the use, would be cause for rejoicing if it were the only factor, for most educators wishing to make duplicate copies of software for their students would meet the test of using those copies for educational, nonprofit purposes rather than for direct commercial benefit. However, the remaining three factors negate the potential support educators desire. The nature of the copyrighted work, in the case of educational software, is--redundantly--educational rather than merely public. It is designed for classroom use and as such receives more rather than less protection from copying. The amount or portion of the original work copied is even more problematic, for it is nearly impossible to copy less than an entire computer program from one disk or cassette to another, and if it were possible, the partially copied program would be all but useless anyway. Finally, the effect of the use upon the potential market clearly renders the copying of courseware an unfair use, for every copy made and used reduces the potential market accordingly.

Many educators today would undoubtedly like to expand the definition of fair use to include making accessible to the maximum number of students the maximum amount of software with a minimum expenditure of taxpayers' dollars. While the definition itself is unlikely to be modified to accommodate this desire, there are other means of providing greater quantities of software at greatly reduced costs. Several of those means are contained within the fifth

and last factor for determining the legality of various uses of software in the educational setting.

e) Licensing agreements frequently restrict the uses of purchased software. Found in manuals or other materials accompanying the disks or cassettes, these licenses become effective when the packaging is unsealed. Though the language varies, the provisions are similar and will read much like this sample license taken from Spinnaker:

> "The distribution and sale of this product are intended for the use of the original purchaser only and for use only on the computer system specified. Lawful users of this program are hereby licensed only to read the program from its medium into the memory of a computer for the purpose of executing this program. Copying, duplicating, selling or otherwise distributing this product is hereby expressly forbidden."

This type of license, however, is designed to regulate the use of a single program by its owner. Schools and school districts often have the option of participating in licensing or leasing agreements much larger in scope; some of these are standardized agreements initiated by the software producers and others are individually negotiated agreements frequently initiated by the school personnel. Details on these broader licensing contracts are presented below but the point of interest here is that the legality of specific usages of educational software will often be determined by the provisions of a license, which are no less binding for being more explicit or more stringent than the copyright law itself.

In short, there are numerous legal questions raised about the complexities of computer hardware and software as used in the schools. And if definitive answers are fewer than we might wish, we can turn to the copyright law, to several legal principles, and to specific license provisions in our

attempts to assess the legality of actual or potential uses of courseware in education. Having established what the copyright law says and what additional legal considerations govern the use of software, we can turn to the questions of copyright violation and then to the effect of copyright violation upon the quality of educational software.

How Serious Is Software Piracy?

How widespread is copyright violation in the form of illegal copying of computer software? No documentation exists for the extensiveness within the field of education, nor in fact is there reliable documentation for other areas such as business or the home market. But industry spokesmen are convinced that approximately one-half of all copies in use by business are illegal copies. Daniel Fylstra, chairman of VisiCorp in San Jose, for example, believes on the basis of numerous visits across the nation that for every copy of the popular VisiCalc electronic spreadsheet there is an illegally copied one being used [4]. As an industry wide figure, "that's extremely conservative," says Brian Lee, vice president of Synapse Software in Richmond, California [5]. Lacking similar estimates from producers of instructional software for the schools, we are left to assume that the extensiveness of piracy in education may be comparable to that in business. Certainly, we have no reason to believe, and courseware producers have not yet claimed, that piracy is more common in the educational setting than in business or home markets. In the absence of documented statistics, we can only characterize the amount of software piracy in education to be "substantial."

Why So Much Piracy?

Copyright violation in the form of illegal duplication of computer

software is extensive because it is easily accomplished and it saves the expense of purchasing what is often very costly software. How easily duplicate copies can be made from a given program depends, of course, to some extent on whether or not that piece of software is copy-protected. Yet even much of the "locked" or copy-protected software designed for use in the schools can be duplicated either with the aid of "copy programs" designed specifically for that purpose or by individuals with some expertise in manipulating computer hardware and software.

Another reason for widespread copyright violation in the schools is that many educators are not yet even aware that making duplicate copies of copyrighted software is a violation of the copyright law. Even those educators who are informed about the legal restrictions on copying software may indulge in the illegal activity, altruistically justifying their actions on two counts: 1) they are providing their students with access to software the district could otherwise not afford; and 2) they are saving the beleaguered taxpayers countless dollars. Instructional programs, after all, may cost anywhere from $30 to $300 for a single program and upwards of $1000 for a total package in, say, math or language skills. The inclination to ignore the copyright law may be bolstered by the knowledge that lone "pirates" are unlikely to be hunted and prosecuted by the software producers, who readily admit that their foremost concern is locating the wholesale distributors and hardware/software retailers who are not only pirating but profiting financially from their illegally copied programs.

Finally, some educators who knowingly violate copyright restrictions on the copying of computer software do so with impugnity because they work in school districts or educational institutions that have not yet established policies or procedures for monitoring the use of software to prevent the

illegal copying or the using of illegally copied programs. These districts and institutions are most likely to be ones in which the administrators themselves are uninformed about the copyright law. In short, software piracy in the field of education occurs because it is easy to do, easy to justify, and hard to detect, especially in the absence of colleagues alert to the presence and illegality of such activity.

The Copyright-Quality Relationship

Before elaborating on the alleged relationship between copyright protection and the quality of educational software, we should briefly establish some assessment of the current perceptions about the quality of instructional software. Educators and evaluators of educational software might be expected to be critical--and they are. Carl Berger, a software evaluation expert at the Universtiy of Michigan, for example, maintains that only 5% of the educational software currently on the market is excellent, 20% is good, and the rest is poor [6]. Even software producers, however, admit to the poor quality of their products. Chuck Carlson of Random House has estimated that "[t]he figures that go around the industry are that only 3-5% of the educational programs that are available are worth looking at" [7]. If the more conservative assessment seems surprising, especially coming from within the ranks of the producers themselves, we should keep in mind the fact that it precedes Berger's assessment by about two years--and all observers agree that improvement is noticeable within that two year span. Nevertheless, two years of raising the level of educational software quality still leaves us with a significant proportion of barely adequate software.

So what does copyright have to do with the quality or the absence of quality in educational software? If we accept at face value the explanation of some software producers, the violation of copyright law restrictions on the

use of computer software robs them of sufficient profits that they simply cannot afford to invest the time and money required to produce higher quality software. Cost estimates range from $20,000-$40,000 for the development of a single program disk to $250,000 for the cost of developing an entire courseware package to $600,000 for the development, testing, manufacturing, packgaging, marketing, overhead, profit and development of accompanying print materials for teachers. When such large investments are required, a large return is expected--and probably necessary. Yet, if potential sales are never realized because one copy can be duplicated or, as we have seen, otherwise utilized to serve numerous students simultaneously, the potential profits never materialize. All of this sounds convincing--at first.

The argument loses some of its persuasiveness, however, when we raise some rather natural questions, beginning with the question: When piracy invades all the software markets, why do only the producers of instructional software blame piracy for the poor quality of their products? Courseware producers do not claim that their product is susceptible to more extensive piracy than other types of software, yet they are the only ones threatening to abandon their enterprise (the school market) because of profit losses due to piracy. Why? VisiCorp chairman Daniel Fylstra, after estimating that half of the business software being used has been illegally copied, admits that the industry is "half the size it should be," yet "[w]e still have a viable industry" [8]. Software producers are expending considerable amounts of money trying to devise technological means of preventing unwanted copying, but their expenses are, of course, passed on to the consumer eventually. Other software producers try to minimize piracy by providing user support for owners of legitimate copies of their programs. MicroPro, producers of the popular Wordstar, for example, have utilized this "enlightened" approach, in part

because it is more cost effective than the various technological approaches, in part because it may enhance public relations--and in part, according to one spokesperson, because the company has not yet found a satisfactory (i.e., effective and cost-effective) technological device or system for preventing unwanted duplication of its products. The point here is that all software producers recognize and suffer from the problem of piracy--yet none but educational software producers are suggesting that they might abandon the enterprise.

From another perspective comes both a new question about the instructional software enterprise and insight into the first question about why only producers of instructional software blame piracy for the inadequacies of their products. That is the perspective of the noncommercial or nonprofit producers of educational software. The oldest, largest and quite possibly the best of these nonprofit producers is the Minnesota Educational Computer Consortium (MECC). While they need not be profit-driven, they are not in the business of losing money either. Most of their software is highly rated by educators and evaluation experts, yet it is made available to schools for a very small fraction of the cost of commercially produced software. Prices will vary since many clients are state education agencies or regional cooperatives which determine their prices for making available to individual school districts the MECC software they lease directly from MECC. But it is common for schools to be able to purchase a disk with several programs on it for $4 or $5.

Even commercial producers, however, are catching on to pricing schemes which will make illegal copying unnecessary from a financial standpoint. Bertamax in Seattle, Washington, leases to the host school of a consortium of at least 50 schools its entire software collection. Each member school pays a first year fee of $500, and an annual fee of only $250 in succeeding

years, for which it receives the number of copies of programs it needs for its instructional program. With access to a current inventory of 250 program disks, a school pays, in effect, $2.50 per disk that first year and for the $250 in following years, it will have access to adequate numbers of any new programs developed by Bertamax. When a school needs only to pay $5.00 or less per disk, which may contain four or five programs on it, the need or motivation to make illegal copies in order to save money is obviously drastically reduced.

If we assess the alternatives to the modus operandi of the commercial software producers--and it is they, not the nonprofit producers who threaten to abandon the enterprise--we begin to question the validity of their self-described plight. In fact, we might question whether the "piracy problem" simply serves as a smokescreen for some commercial producers of educational software who have rushed into a new market when any program that ran was considered good. Yes, they undoubtedly could produce better quality software if they could invest more money, which they would do if they could reap their expected profits. But high quality software is already being produced in spite of piracy. Competition from a growing reservoir of high quality instructional software (whether commercially or noncommercially produced) is much more likely to result in raising the overall level of quality than is the elimination or reduction of piracy.

We might hope that the quality of educational software will further be improved as the publishers of textbooks and other instructional materials begin to incorporate software into their line of products. This sector is a special subset of the commercial producers who have just received such a harsh judgment, and as such it deserves partial exemption from that judgment. Textbook publishers now marketing computer courseware are not, after all, the

the ones threatening to abandon the school market. And their development of educational software is a natural expansion of their well-established mission to provide other forms of instructional materials. Textbooks publishers, furthermore, have one advantage over the other instructional software producers: a history of experience with the educational system and its curriculum. Their products can be expected to "fit into" the curriculum--a very real concern among educators. This concern is so strong, in fact, that many educators tend to purchase the more expensive commercially produced courseware over the MECC software in spite of their high regard for the quality of the latter--precisely because it is perceived to fit into the curriculum and achieve educational objectives more closely [9]. In addition to experience with such essential aspects of software development as field testing and greater awareness of grade level distinctions, textbook publishers have the additional advantage over most other instructional software producers of not being totally dependent for profits on the sales of their software. If in the early phases their software venture is not acceptably profitable, any losses or marginal profits can temporarily be absorbed by the larger enterprise. In short, the textbook publishers can probably be expected to offer a growing collection of instructional software which is at least acceptable and perhaps sometimes outstanding in quality.

The quality of educational software, then, is much less dependent upon the effectiveness of the copyright law than it is upon the knowledge of software producers (designers, programers, developers) about existing curriculum, about learning theory and child development as it pertains to age and grade level distinctions. Familiarity and experience with these factors as well as increased involvement of educators in the design of software will minimize current flaws in pedagogically deficient courseware; and time, experience, and competition may well reduce the technological or functional

flaws that account for the poor quality of much of contemporary software.

Can We Assure Quality in Educational Software?

If copyright has only a tenuous relationship with the quality of instructional software as we have demonstrated, can we assure quality in the software being used by our young people in the schools? If so, who has the responsibility and the ability to assure the desired quality? And what power or influence do they have with which to accomplish this necessary task?

Believers in the free enterprise system may argue that competition itself will eventually raise the level of quality in educational software. Once educators become more familiar with computerized instruction, they will become more sophisticated and demanding consumers, selecting the best software on the market and leaving the inferior software on the inventory shelves. Skeptics, however, argue that such competition assures little more than the success of the most sophisticated marketing schemes, for such competition among textbook publishers and similar competition in other lines of products has seldom guaranteed quality, they maintain.

Competition in the marketplace can, however, provide quality products when consumers are informed and when they demand quality. In terms of educational software, this means that educators must become familiar with computers and computer software, familiar with the sources for software evaluation, and familiar with the criteria for evaluating instructional software. With this knowledge, they will be able to select the better quality instructional programs and thereby signal to the producers what they want, what they expect and what they will buy--information some commercial software producers now claim is unavailable and another factor in determining the quality of courseware now being produced.

The newness of the software market and products has occasioned numerous

software evaluation agencies and experts whose findings are published in innumerable education journals, reasonably accessible to most educators. Furthermore, workshops and seminars on evaluating software are proliferating, being offered by many professional associations and state or regional education agencies as well as by higher education personnel. Perhaps the easy access to independent evaluations will raise teacher expectations for the quality of software in contrast to their passive acceptance of textbook materials for which there has been little systematic evaluation by independent sources. If so, we can look for a higher overall level of quality in educational software than in the textbooks of the past and present. But the assurance of quality software, for better or worse, rests primarily with educators whose purchases ultimately determine what the software producers create, market and sell. And those in higher education who provide pre- or in-service education for teachers and administrators have a special responsibility to develop the knowledge about and skills with computerized instruction that will enable their educator-students to be the informed consumers requisite to assuring the quality of instructional software.

ENDNOTES

1. SchoolTechNews, Jan./Feb. 1984, p.2.

2. See FINAL REPORT of the National Commission on New Technological Uses of Copyrighted Works, Library of Congress, Washington, D.C., 1978.

3. See Daniel Brooks, "Fair Use of Educational Software," in Virginia Helm, Quality and Copyright: Issues in Computer-Assisted Instruction, Washington, D.C.: Association of Educational Communications and Technology, 1984, pp. ____. (forthcoming)

4. Eric Larson. "Stiffened Software-Copyright Protection By Court Isn't Expected to Thwart Pirates," The Wall Street Journal, September 6, 1983, p.2, col. 3 & 4.

5. Larson, p. 2.

6. Carl Berger, Presentation to 1983 National Association of Elementary School Principals (NAESP) National Fellows Program, Orlando, Fla., July 4, 1983.

7. "Quality Software: How To Know When You've Found It!" Electronic Learning, Nov./Dec. 1981, p.34.

8. Larson, p. 2.

9. Charlie Euchner, "Urban Districts Found Lagging in Computerized Instruction," Education Week, January 18, 1984, p.14.